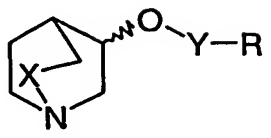
Claims:

1. An aza-bicycloalkyl derivative of formula I

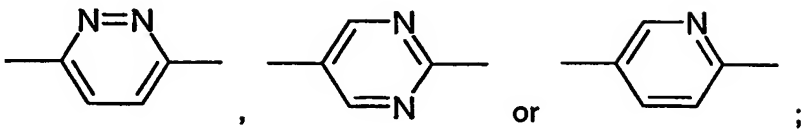


(I)

wherein

X is CH_2 or a single bond;

Y is a group of formula



R is a substituted or unsubstituted C_5-C_{10}aryl or substituted or unsubstituted hetero-C_5-C_{10}aryl, $N(R^1)(R^4)$, or $N(R^2)(CHR^3R^4)$;

each of R^1, R^2 and R^3 is independently H, C_1-C_4alkyl, or CF_3; and

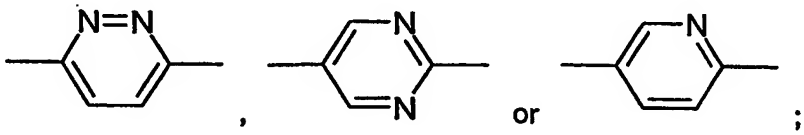
R^4 is a substituted or unsubstituted C_5-C_{10}aryl or substituted or unsubstituted hetero-C_5-C_{10}aryl;

in free base or acid addition salt form.

2. An aza-bicycloalkyl derivative of formula I according to claim 1 wherein

X is CH_2 or a single bond;

Y is a group of formula



and

R is phenyl, naphthyl, tetrahydronaphthyl, indanyl, thienyl, benzothienyl, furanyl, benzofuranyl and isobenzofuranyl, which in each case can be unsubstituted or mono-, di- or trisubstituted by

halogen, cyano, formyl, acetyl, C_1-C_3alkoxycarbonyl, N,N-di-(C_1-C_3alkyl) carbamoyl, phenyl, phenoxy, methylendioxy, ethylendioxy; or

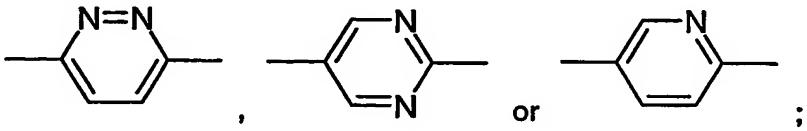
C_1-C_4alkyl, C_2-C_4alkenyl, C_2-C_4alkinyl or C_1-C_4alkoxy, which radicals themselves can be unsubstituted or mono-, di- or trisubstituted by halogen;

in free base or acid addition salt form.

3. An aza-bicycloalkyl derivative of formula I according to claim 1 wherein

X is CH_2 or a single bond;

Y is a group of formula



and

R is

(a) phenyl which is unsubstituted or mono-, di- or trisubstituted by

halogen, cyano, methylendioxy,

C_1-C_4alkyl, which is unsubstituted or mono-, di- or trisubstituted by halogen, or

C_1-C_4alkoxy, which is unsubstituted or mono-, di- or trisubstituted by halogen,

(b) naphthyl, indanyl, tetralinyl or

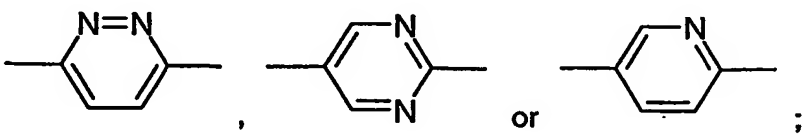
(c) furanyl, benzofuranyl, isobenzofuranyl, benzothienyl or thienyl,

in free base or acid addition salt form.

4. An aza-bicycloalkyl derivative of formula I according to claim 1 wherein

X is CH_2 or a single bond;

Y is a group of formula



R is

(a) phenyl which is unsubstituted or mono-, di- or trisubstituted by

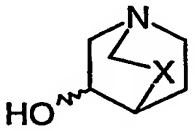
halogen, cyano, methylendioxy,

C_1-C_4alkyl, which is unsubstituted or mono-, di- or trisubstituted by halogen, or
C_1-C_4alkoxy, which is unsubstituted or mono-, di- or trisubstituted by halogen,
(b) naphthyl, or
(c) furanyl, benzofuranyl, isobenzofuranyl, or thienyl,
in free base or acid addition salt form.

5. A process for the preparation of an aza-bicycloalkyl derivative of formula I as defined in claim 1, or a salt thereof, which comprises the step of reacting a compound of formula II

z-Y-R (II)

wherein Y and R are as defined in claim 1 and z is a leaving group with a compound of formula III



(III)

wherein X is as defined in claim 1,
and recovering the so obtained compound of formula I in free base or acid addition salt form.

6. The aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, for use as a pharmaceutical.

7. The aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, for use in the prevention and treatment of psychotic and neurodegenerative disorders.

8. A pharmaceutical composition comprising an aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, in association with a pharmaceutical carrier or diluent.

9. The use of an aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, as a pharmaceutical for the prevention and the treatment of psychotic and neurodegenerative disorders.

10. The use of an aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, for the manufacture of a medicament for the prevention and treatment of psychotic and neurodegenerative disorders.

11. A method for the prevention and treatment of psychotic and neurodegenerative disorders, in a subject in need of such treatment, which comprises administering to such subject a therapeutically effective amount of an aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form.

12. An aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, for use in the treatment or prevention of a disease or condition in which α7 nAChR activation plays a role or is implicated.

13. The use of an aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form, as a pharmaceutical for the treatment or prevention of a disease or condition in which α7 nAChR activation plays a role or is implicated.

14. A method for treating or preventing a disease or condition in which α7 nAChR activation plays a role or is implicated, in a subject in need of such treatment, which comprises administering to such subject a therapeutically effective amount of an aza-bicycloalkyl derivative according to any one of claims 1 to 4 in free base or pharmaceutically acceptable acid addition salt form.